

Claims

1. Apparatus for determining potency of a medication, comprising:

a supply of medication in a container;

5 a temperature sensor operatively coupled to the container and capable of measuring the temperature of the medication to generate temperature data;

a programmable real time clock;

10 a controller programmed with medication temperature profile data specific to the medication, wherein the controller integrates temperature data and time data with medication temperature profile data on a continuous basis to generate a potency value for the medication.

2. The apparatus of claim 1 wherein the controller accumulates temperature data and compares the temperature data to the medication temperature profile data according to a multiply and accumulate function to generate the potency value.

15 3. The apparatus of claim 1 including a programming interface operatively connected to the controller so that time data and medication temperature profile data may be programmed into the controller.

20 4. The apparatus of claim 1 including a display operatively connected to the controller for providing perceptible information corresponding to the potency value.

25 5. The apparatus of claim 4 wherein the container comprises a metered dose inhaler comprising a drop generator coupled to the supply of medication and the controller is configured for deactivating the drop generator in response to generation of a potency value that exceeds a predetermined threshold value.

6. The apparatus of claim 1 wherein the potency value corresponds to a predetermined potency condition of the medication based on integration of temperature date and time data with medication temperature profile data.

5 7. The apparatus of claim 1 wherein the container includes means for decreasing the dosage of medication in response to predetermined potency value of the medication based on integration of temperature date and time data with medication temperature profile data.

8. The apparatus of claim 1 wherein the temperature sensor comprises a temperature sensing integrated circuit in direct contact with the medication.

10 9. The apparatus of claim 1 wherein the temperature sensor comprises a temperature sensing integrated circuit in direct contact with the container.

10. The apparatus of claim 1 including a temperature sensor configured for measuring ambient temperature.

15 11. The apparatus of claim 1 wherein the container comprises a metered dose inhaler having a drop generator capable of expelling a dosage of medication through a mouthpiece.

20 12. The apparatus of claim 11 wherein the controller is programmed for adjusting the dosage of medication expelled through the mouthpiece in response to integration of temperature data and time data with medication temperature profile data.

13. The apparatus of claim 11 wherein the controller is programmed for disabling the drop generator in response to an expiration date.

14. A method of determining the potency of a medication, comprising the steps of:

- 25 (a) monitoring the temperature of the medication over time;
- (b) accumulating temperature data generated in step (a);

(c) comparing over time the accumulated temperature data with medication temperature profile data specific to the medication;

(d) calculating over time a potency condition of the medication based on the comparison of the accumulated temperature data with medication temperature profile data; and

(e) if the calculated potency condition equals a predetermined potency threshold, providing an alert of an medication expiration condition.

15. The method of claim 14 including the step of delivering a dosage of medication determined by the comparison of the accumulated temperature data with medication temperature profile data.

16. The method of claim 14 used with a medication delivery apparatus and including the step of disabling the apparatus in response to the calculation of an expiration date.

17. Apparatus for determining the therapeutic potency of a medication, comprising:

a temperature sensor operatively connected to a supply of a medication such that the temperature sensor measures the temperature of the medication to generate temperature data;

a real time clock circuit programmed with a begin date;

a controller programmed with medication temperature profile data specific to the medication and configured for accumulating temperature data and calculating an ongoing therapeutic potency condition based on comparison of the temperature data and medication temperature profile data.

18. The apparatus of claim 17 including a user-readable display, and wherein when an expiration date is calculated a expiration alert message is displayed the user-readable display.

19. The apparatus of claim 17 including means for delivering medication in a dosage determined by the therapeutic potency condition.

20. The apparatus of claim 19 including means for ceasing delivery of medication when a predetermined potency threshold is met.

5 21. The apparatus of claim 20 wherein the supply of medication is contained in a metered dose inhaler.

22. A medication delivery apparatus, comprising:

a housing including a mouthpiece;

a supply of medication carried in a container in the housing;

10 a temperature sensor operatively coupled to the container and configured for measuring the temperature of the medication to generate temperature data;

a programmable real time clock;

15 a programmable controller with medication temperature profile data specific to the medication, wherein the controller is programmed to calculate on an ongoing basis a potency condition for the medication.

23. The medication delivery apparatus of claim 22 wherein the controller integrates temperature data and time data with medication temperature profile data to generate the potency condition.

20 24. The medication delivery apparatus of claim 23 wherein the controller is programmed to calculate an expiration date for the medication when integration of temperature data and time data with medication temperature profile data generates a result that meets a predetermined threshold value.

25. The medication delivery apparatus of claim 24 including a drop generator configured for generating droplets of medication and expelling the droplets through the mouthpiece in response to activation of a switch.

5 26. The medication delivery apparatus of claim 25 wherein the controller is programmed to deactivate the switch in response to calculation of an expiration date.

27. A pharmaceutical container, comprising:
medication supply means for containing a pharmaceutical;
temperature sensor means for measuring the temperature of the
10 pharmaceutical and for thereby generating temperature data;

real time clock means;
controller means with medication temperature profile data specific to the medication, the controller means configured for calculating a medication potency condition based on integration of temperature data and medication
15 temperature profile data over time.

28. The apparatus of claim 27 wherein the temperature sensor means further comprises a temperature sensing integrated circuit.

29. The apparatus of claim 27 wherein the real time clock means further comprises a programmable real time clock integrated circuit.

20 30. The apparatus of claim 27 including medication delivery means for delivering a controlled dosage of the medication to a patient and wherein the controller means further comprises means for controlling the dosage of delivered medication based upon the calculated potency condition.

25 31. The apparatus of claim 30 wherein the controller means is configured for deactivating the medication delivery means to prevent delivery of medication if the calculated potency condition meets a predetermined threshold.